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Using Health State Utility Values from the General Population to Approximate Baselines in Decision Analytic Models when Condition-Specific Data are Not Available

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ABSTRACT

Background: Decision analytic models in health care require baseline health-related quality of life data to accurately assess the benefits of interventions. The use of inappropriate baselines such as assuming the value of perfect health (EQ-5D = 1) for not having a condition may overestimate the benefits of some treatment and thus distort policy decisions informed by cost per quality adjusted life years thresholds. **Objective:** The primary objective was to determine if data from the general population are appropriate for baseline health state utility values (HSUVs) when condition specific data are not available. **Methods:** Data from four consecutive Health Surveys for England were pooled. Self-reported health status and EQ-5D data were extracted and used to generate mean HSUVs for cohorts with or without prevalent health conditions. These were compared with mean HSUVs from all respondents irrespective of health status. **Results:** More than 45% of respondents (n = 41,174) reported at least one condition and almost 20% reported at least two. Our results suggest that data from the general population could be used to approximate baseline HSUVs in some analyses, but not all. In particular, HSUVs from the general population would not be an appropriate baseline for cohorts who have just one condition. In these instances, if condition specific data are not available, data from respondents who report they do not have any prevalent health condition may be more appropriate. Exploratory analyses suggest the decrement on health-related quality of life may not be constant across ages for all conditions and these relationships may be condition specific. Additional research is required to validate our findings.

Keywords: age-adjusted, baseline, EQ-5D, health state utility values, quality of life.

Introduction

Agencies such as the UK National Institute for Health and Clinical Excellence (NICE) produce national guidance on the provision of new health technologies, and their recommendations are informed by reviews of clinical and economic evidence. To facilitate consistent reimbursement recommendations across all disease areas, interventions are appraised using a decision rule based on the incremental cost per quality-adjusted life year (QALY). The costs per QALY results are estimated using decision analytic models that describe the clinical pathway of health conditions or systems mathematically.

Analytic models frequently compare the benefits of treatments that have the potential to alleviate a health condition or avoid a clinical event. Conditions and events are described by health states in the models and the health related quality of life (HRQoL) or health state utility values (HSUV) associated with these are generally obtained from clinical trials or observational studies. The baseline HRQoL used to represent the HSUVs for individuals without these conditions or events is equally relevant as these data are used to assess the HRQoL gain in alleviating or avoiding the condition or event.

Ideally the baseline HSUVs would be derived from people without specific condition(s) using the definitions of health states in the model. However, these data are rarely available and a baseline of full health is commonly assumed [1]. Because the average person still has other health problems, this assumption overestimates the benefits of treatment [2,3] and it has been suggested that on average, a treatment will increase HRQoL to the same level as persons without the condition [4]. The baseline HSUVs used in decision models have important consequences as these data could distort a policy decision based on a cost per QALY threshold thus undermining efficient resource allocation [5].

When condition specific baseline data are not available, one solution has been to use age-adjusted HSUVs obtained from the general population (irrespective of health condition) [1,2]. These data will include individuals with the condition of interest; hence, an element of double counting is inevitable. However, unless the prevalence of the health condition is high or the affect on HRQoL is substantial, intuitively one would expect the HRQoL of an average person without a particular health condition to be similar to the HRQoL of an average person of a similar age in the general population. Researchers have shown that in cardiovascular disease (CVD) the cost per QALY results are of a similar magnitude when estimated using either a baseline from the general population or a baseline from respondents with no history of CVD [5].

The primary objective of our study is to determine if this finding generalizes to other conditions and thus, if data from the gen-

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eral population are appropriate as baseline HSUVs in decision models. Specifically, we compare the HRQoL for subgroups who have a particular prevalent health condition (irrespective of other conditions) with the HRQoL from similar-aged subgroups who do not have the condition (irrespective of other health conditions), and the HRQoL from similar-aged subgroups irrespective of health status (i.e., the general population). As a secondary analysis, we compare the HRQoL for subgroups who have just one particular prevalent health condition with the HRQoL from similar-aged subgroups who do not have any condition, and the HRQoL from similar-aged subgroups irrespective of health status (i.e., the general population).

Methods

Data

We used HRQoL data and information on health status collected in the Health Survey for England (HSE) [6]. The HSE is an annual survey conducted on randomly selected samples of the population living in private households in England. For this study, we pooled data collected during the 2003, 2004, 2005, and 2006 surveys. Information on health status was obtained from responses to the following question: "Do you have any long-standing illness, disability, or infirmity? By long-standing I mean anything that has troubled you over a period of time, or that is likely to affect you over a period of time?" Respondents provided details for a maximum of six long-standing illnesses and responses were subsequently coded into 39 different health conditions. Two additional codes: "unclassifiable" and "complaint no longer present" were treated as no condition in our analyses.

HRQoL information was collected using the widely used generic questionnaire known as the EQ-5D [7]. The EQ-5D contains five attributes of health status, including mobility, self-care, usual activities, pain/discomfort, and anxiety/depression. Each attribute is measured by a question with three possible responses: no problem, some problems, or severe problem. The combination of all possible responses leads to 243 (3^5) distinct health states. A random sample of the UK general public valued a sample of these health states using time trade-off techniques [7]. The resulting algorithm, which was used to calculate HSUVs for our study, produces a range of −0.59 to 1, where 1 represents perfect health, 0 represents death, and negative values represent health states considered to be worse than death.

Analysis

Generally patients in decision analytic models are defined to match the demographic characteristics of patients who would receive the intervention under evaluation in clinical practice. Consequently a typical patient will have concurrent health conditions and for older aged cohorts, a substantial proportion of patients will have additional prevalent health conditions. However, the effectiveness and HRQoL evidence used to assess the benefits of treatments may be derived from studies using strict recruitment criteria and patients with comorbidities can be excluded from these. As the baseline needs to reflect the definitions and data used in the model, we perform a series of analyses as described below.

1. The primary analyses test whether data from the general population can be used as the baseline HRQoL when data from cohorts with a specific health condition (irrespective of other health conditions) are used to assess the benefits of treatment. We compare mean EQ-5D scores for these subgroups with mean EQ-5D scores from respondents of a similar age who did not have the specific health condition, and respondents of a similar age irrespective of health status (i.e., the general population).
2. The secondary analyses test whether data from the general population can be used as the baseline HRQoL when data from cohorts with a single health condition are used to assess the benefits of treatment. We compare mean EQ-5D scores for these subgroups with mean EQ-5D scores from respondents of a similar age who do not have any health conditions and respondents of a similar age irrespective of health status (i.e., the general population).
3. Exploratory analyses were also performed to test if the decrements on HRQoL for cohorts with a specific health condition (irrespective of other health conditions) are comparable to the decrements for cohorts with the single specific health condition (and no other condition), and if the decrements on HRQoL are constant across age.

All analyses were performed in STATA (version 11, 2010, StataCorp, College Station, TX). The analyses were weighted using the individual level self-administered questionnaire weights [6]. Using the minimal important difference for the EQ-5D (0.074) as a benchmark [8] and assuming SD 0.20 in EQ-5D scores, we used subgroups of more than 64 (256) respondents for having the power to detect a mean difference of 0.10 ± 0.05 with 80% power and 5% two-sided significance. Statistical significance for the weighted mean EQ-5D scores was assessed using the 95% confidence intervals (CI) of the mean whereby if the CIs do not overlap there is a statistically significant difference between the groups [9].

Results

Of the 41,174 respondents who completed the EQ-5D questionnaire, 44.5% (18,302 of 41,174) were male, and the mean age was 48.6 ± 18.5 years for males and 48.5 ± 19.0 years for females. 54.5% (22,449 of 41,174) reported they did not have a history of a health condition, 26.1% (10,762 of 41,174) reported just one condition, and 19.3% (7,963 of 41,174) reported at least two conditions. The most prevalent condition (Table A1 appendix available at: doi:10.1016/j.jval.2010.10.029) was "arthritis/rheumatism/fibrositis" at 10.1% (4,145 of 41,174) of the sample followed by "hypertension/high blood pressure" at 7.7% (3,172 of 41,174). Prevalence of comorbid health conditions varied by primary health condition and by age. The proportion of respondents with more than one health condition ranged from 84.2% (123 of 146) of respondents with "other bladder problems/incontinence" to 54.0% (1325 of 2452) of respondents with asthma. For respondents (n = 4212) aged 40 years or younger who reported at least one health condition, just 22.2% had at least one other condition whereas 57.4% of respondents (n = 1638) aged 40 years or younger who reported at least one health condition had at least one other condition.

The mean EQ-5D for all respondents (n = 41,174) was 0.868 (range −0.594 to 1). Respondents (n = 22,449) who reported no health condition had a mean EQ-5D of 0.949 (range −0.371 to 1), whereas respondents who reported one or more than one health condition had mean EQ-5D scores of 0.821 (range −0.594 to 1) and 0.654 (range −0.594 to 1), respectively.

Primary analyses

With the exception of respondents who had a history of hayfever (n = 416), all mean EQ-5D scores for respondents who reported they had a specific health condition irrespective of whether they also had other health conditions (Table 1 and online appendix available at: doi:10.1016/j.jval.2010.10.029) were lower than the mean EQ-5D scores for the subgroups who either did not have the condition or the subgroups irrespective of health status. Four of the 39 subgroups had <64 respondents and were not assessed in terms of significant differences in mean scores. Because the confidence intervals of the mean EQ-5D scores did not overlap for 27/35 pairs when comparing with subgroups without the condition and 26 of 35 pairs when comparing with subgroups irrespective of health condition, the differ-

Table 1 – Primary analyses for the 10 largest subgroups: comparing mean EQ-5D scores for respondents subgrouped by health condition (plus any other health condition), respondents of a similar age without the health condition, and respondents of a similar age irrespective of health status.

Health condition	Mean age	Respondents affected by the health condition (and any other health condition)			Respondents of a similar age not affected by the health condition				Respondents of a similar age irrespective of health status (i.e., general population)			
		n	Mean EQ-5D	95% CI of the mean	n	Mean EQ-5D	95% CI of the mean	Absolute difference	n	Mean EQ-5D	95% CI of the mean	Absolute difference
Arthritis/rheumatism/ fibrositis	62.9	4145	0.597	(0.584, 0.609)	436	0.862	(0.836, 0.888)*	0.265	538	0.812	(0.785, 0.839)†	0.215
Asthma	44.2	2452	0.797	(0.779, 0.814)	674	0.890	(0.873, 0.907)†	0.093	714	0.885	(0.868, 0.902)†	0.088
Back problems/slipped disc/spine/neck	50.0	2484	0.649	(0.632, 0.666)	615	0.888	(0.870, 0.905)†	0.239	668	0.866	(0.847, 0.885)†	0.217
Diabetes including hyperglycemia	60.4	1772	0.714	(0.695, 0.731)	592	0.845	(0.823, 0.866)†	0.131	628	0.841	(0.819, 0.862)†	0.127
Heart attack/angina	68.5	929	0.628	(0.602, 0.653)	569	0.826	(0.802, 0.850)†	0.198	603	0.822	(0.798, 0.846)†	0.194
Hypertension/high blood pressure	62.3	3172	0.777	(0.765, 0.788)	451	0.812	(0.787, 0.835)	0.035	522	0.811	(0.788, 0.832)	0.034
Mental illness/anxiety/ depression/nerves	45.5	1332	0.606	(0.585, 0.626)	645	0.878	(0.861, 0.894)†	0.272	682	0.856	(0.836, 0.876)†	0.250
Other endocrine/metabolic diseases	56.4	1566	0.771	(0.747, 0.793)	655	0.830	(0.797, 0.861)†	0.059	696	0.821	(0.790, 0.852)	0.050
Other heart problems	64.0	1349	0.672	(0.649, 0.694)	496	0.802	(0.771, 0.831)†	0.130	528	0.795	(0.765, 0.824)†	0.123
Other problems of bones/ joints/muscles	54.9	2526	0.642	(0.628, 0.656)	627	0.854	(0.833, 0.874)†	0.212	696	0.821	(0.790, 0.852)†	0.179

Absolute difference is the absolute difference in mean EQ-5D score compared to the mean EQ-5D score for the subgroup of respondents affected by the health condition.

All confidence intervals (CIs) for mean EQ-5D overlap ($P > 0.05$) when comparing: respondents not affected by the condition vs. respondents irrespective of health status.

Corresponding data for the full set of subgroups are available in the online Appendix.

* CIs for mean EQ-5D do not overlap ($P < 0.05$) when comparing respondents with the condition vs. respondents not affected by the condition.

† CIs for mean EQ-5D do not overlap ($P < 0.05$) when comparing respondents with the condition vs. respondents irrespective of health status.

ences were significant at $P < 0.05$. Comparing the mean EQ-5D scores for respondents not affected by a condition with the corresponding mean scores for respondents irrespective of health condition, the confidence intervals of the paired mean scores overlapped.

These data can be used to assess the average absolute or relative effect on HRQoL compared to an average person of a similar age who does not have the named condition, or an average person of a similar age irrespective of health status. For example, the condition stroke/cerebral hemorrhage/cerebral thrombosis produced the largest average decrement on HRQoL compared to the subgroup who did not have the condition (absolute 0.287, relative 35%) and the subgroup from the general population (absolute 0.282, relative 34%). When compared to subgroups without the health condition, and when compared to subgroups irrespective of health status, 31 of 35 of the differences in mean EQ-5D scores for the groups with >64 respondents were greater than the minimal important difference (0.074) for the EQ-5D [8].

Secondary analyses

For the subgroups who reported they had a single specific health condition compared to subgroups of a similar age who reported no health condition, with the exception of respondents who had a history of hayfever (n = 186) and respondents who had a history of poor hearing/deafness (n = 146), all mean EQ-5D scores were lower for the subgroups with the condition (Table 2 and online appendix available at: doi:10.1016/j.jval.2010.10.029). Ten of the 39 subgroups had <64 respondents hence were not assessed in terms of significant differences in mean scores. Of the remaining 29 pairs compared to subgroups who reported no condition, as the confidence intervals of the mean EQ-5D scores did not overlap for 24 comparisons, the differences were significant at $P < 0.05$. When comparing the mean EQ-5D scores for subgroups with a single health condition with subgroups of a similar age irrespective of health status (i.e., general population), of the 29 subgroups involving more than 64 respondents, the mean scores were greater for 13 of the subgroups with a single condition. As the CIs for the mean EQ-5D scores did not overlap for eight of the 13 pairs, these differences were statistically significant ($P < 0.050$). For the remaining 16/29 subgroups with mean EQ-5D scores smaller than those of similar aged subgroups irrespective of health status, the CIs of the mean EQ-5D scores did not overlap for 5/16 comparisons ($P < 0.05$).

These data can be used to assess the average absolute or relative effect on HRQoL for a single condition in isolation compared to an average person of a similar age who does not have any condition, or an average person of a similar age irrespective of health status. For example the condition stroke/cerebral haemorrhage/cerebral thrombosis produced the second largest average decrement on HRQoL compared to the subgroup who had no condition (absolute 0.254, relative 27%) and the subgroup from the general population (absolute 0.106, relative 13%). When compared to subgroups without a health condition, 17 of 29 of the differences in mean EQ-5D scores were greater than the minimal important difference (0.074) for the EQ-5D, whereas just 9 of 29 of the differences were greater than the minimal important difference when compared to the subgroups irrespective of health status [8].

Exploratory analyses

1. Comparing average decrements on HRQoL for cohorts with a specific health condition (irrespective of other health conditions) with average decrements for corresponding cohorts with

Table 2 – Secondary analyses for the 10 largest subgroups, comparing mean EQ-5D score for respondents with a single health condition, respondents of a similar age with no health condition, and respondents of a similar age irrespective of health status.

Health condition	Mean age	Respondents affected by the one health condition (and no other health condition)			Respondents of a similar age with no health condition				Respondents of a similar age irrespective of health status (i.e., general population)			
		n	Mean EQ-5D	95% CI of the mean	n	Mean EQ-5D	95% CI of the mean	Abs diff	n	Mean EQ-5D	95% CI of the mean	Abs diff
Arthritis/rheumatism/fibrositis	60.1	1358	0.685	(0.662, 0.706)	286	0.936	(0.918, 0.953)*	0.251	628	0.841	(0.819, 0.862)†	0.156
Asthma	37.6	1127	0.931	(0.922, 0.939)	500	0.953	(0.943, 0.962)*	0.022	794	0.903	(0.889, 0.916)†	−0.028
Back problems/slipped disc/spine/neck	45.5	1106	0.745	(0.727, 0.761)	461	0.952	(0.942, 0.960)*	0.207	736	0.879	(0.863, 0.895)†	0.134
Diabetes including hyperglycemia	55.2	537	0.898	(0.883, 0.912)	315	0.952	(0.937, 0.965)*	0.054	670	0.835	(0.813, 0.856)†	−0.063
Hypertension/high blood pressure	59.8	974	0.916	(0.903, 0.928)	286	0.936	(0.918, 0.953)	0.020	628	0.841	(0.819, 0.862)†	−0.075
Mental illness/anxiety/depression/nerves	40.6	541	0.709	(0.685, 0.733)	535	0.955	(0.946, 0.964)*	0.246	826	0.877	(0.856, 0.897)†	0.168
Other endocrine/metabolic diseases	48.3	422	0.924	(0.909, 0.937)	369	0.948	(0.934, 0.960)	0.024	647	0.858	(0.832, 0.882)†	−0.066
Other heart problems	58.2	366	0.822	(0.781, 0.862)	288	0.938	(0.921, 0.953)*	0.116	637	0.829	(0.808, 0.849)	0.007
Other problems of bones/joints/muscles	48.9	942	0.731	(0.709, 0.753)	349	0.946	(0.933, 0.959)*	0.253	645	0.843	(0.802, 0.884)†	0.163
Other problems of nervous system	48.2	336	0.695	(0.663, 0.726)	369	0.948	(0.934, 0.960)*	0.130	647	0.858	(0.832, 0.882)†	0.04

Abs diff is the absolute difference in mean EQ-5D score compared to the mean EQ-5D score for the subgroup of respondents affected by the health condition.
All confidence intervals (CIs) for mean EQ-5D do not overlap ($P < 0.05$) when comparing respondents with no health condition vs. respondents irrespective of health status.
Corresponding data for the full set of subgroups are available in the online Appendix.
* CIs for mean EQ-5D do not overlap ($P < 0.05$) when comparing respondents with the condition vs. respondents with no health condition.
† CIs for mean EQ-5D do not overlap ($P < 0.05$) when comparing respondents with the condition vs. respondents irrespective of health status.

just the single specific health condition. In 14 of the 39 conditions, the average decrements on HRQoL were more than halved for the subgroups with just the one health condition (vs. subgroups with no condition) compared to the average decrements on HRQoL for the subgroups with the same condition irrespective of other conditions (vs. subgroups without the specific condition irrespective of other conditions). For example the average relative decrement was 2% for respondents (n = 1127) with just asthma when compared to respondents of a similar age without any health condition versus an average relative decrement of 10% for respondents (n = 2452) with asthma and any other health condition when compared to respondents of a similar age without asthma. These data suggest comorbidities impose an additional decrement on HRQoL and the implication of this should be considered on an individual basis when calculating decrements attributed to the alleviation of conditions or avoidance of clinical events in economic models.

2. Comparing decrements on HRQoL across age groups. Using the full data set, HRQoL decreased by age (Fig. 1) in general irrespective of the number of health conditions. The rate of decrease in HRQoL by age was greatest in respondents aged over 65 years. Comparing the mean EQ-5D scores for the youngest and oldest aged cohorts subgrouped by health status, the reduction in HRQoL was greatest for respondents with at least one health condition.

Potential trends in decrements in HRQoL by age for the individual health conditions were assessed visually by plotting mean EQ-5D scores for age and health condition stratified subgroups together with the average absolute and relative decrements (Fig. 2 [Fig. A2 and Fig. A3 supplied in the Appendix available at: doi:10.1016/j.jval.2010.10.029]). Due to small numbers in the age stratified data, these exploratory analyses were performed for the most prevalent health conditions only, and the data were compared to respondents who did not have the relevant condition. For the cohort (n = 2484) with back problems/slipped disc/spine/neck plus any other health condition, the average relative decrement on HRQoL compared to respondents without the condition increased by age up to age 80 years (Fig. 2a). This trend was also visible in the cohort (n = 1106) with just back problems/slipped disc/spine/neck (Fig. 2b) when compared to respondents with no health condition. The age stratified average absolute decrements (range 0.19 to 0.29) were similar for the cohorts with or without comorbid health conditions. Compared to the respondents without the condition, as the CIs for the mean EQ-5D scores did not cross, all the age-stratified decrements were statistically significant at the 95% level.

Conversely, for the cohort (n = 3172) with hypertension/high blood pressure/blood plus any other condition the relative decrement on HRQoL compared to respondents without the condition decreased by age with the largest effects observed in respondents aged under 60 years (Appendix, Fig. A1a available at: doi:10.1016/j.jval.2010.10.029). The average effect on HRQoL was much smaller across all age groups for the cohort with just hypertension/high blood pressure/blood (n = 974) compared to the average effect on HRQoL for the cohort with hypertension/high blood pressure/blood and any other health condition (Appendix, Fig. A1b available at: doi:10.1016/j.jval.2010.10.029).

For the cohort (n = 4145) with arthritis/rheumatism/fibrositis plus any other health condition, the average relative decrement on HRQoL compared to subgroups without the condition decreased

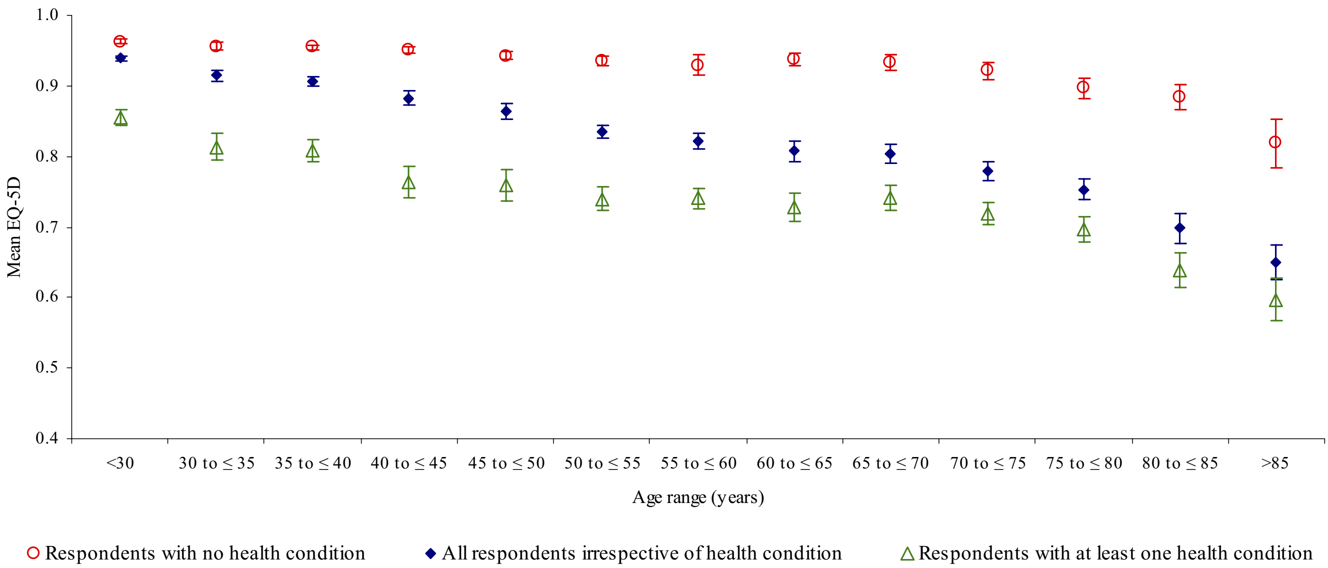

Fig. 1 – Mean EQ-5D scores (and 95% confidence interval) stratified by age and number of health conditions.

slightly by age for respondents aged over 40 years (Appendix, Fig. A2 available at doi:10.1016/j.jval.2010.10.029). Conversely, for the cohort (n = 1358) with just arthritis/rheumatism/fibrositis and no other condition, compared to respondents with no health condition, the average relative decrement on HRQoL increased by age. When comparing the mean EQ-5D scores from cohorts with just arthritis/rheumatism/fibrositis with the mean EQ-5D scores for cohorts with arthritis/rheumatism/fibrositis plus any other condition, the confidence intervals of the mean EQ-5D scores did not overlap for the cohorts aged between 40 years and 70 years only. All age- and condition-specific mean EQ-5D scores used in the analyses that are not discussed in the article are provided in the online Appendix at: doi:10.1016/j.jval.2010.10.029.

Discussion

This study provides EQ-5D scores obtained from noninstitutionalized residents in England stratified by self-reported history of prevalent health condition(s) and age (where sample sizes permit). Our results suggest that data from the general population irrespective of health status could be used in place of condition specific data to represent the HSUVs associated with not having a particular health condition in some analyses but not all. In particular, our analyses show that HSUVs from the general population would not be appropriate for cohorts who have just one health condition. In these instances, if the condition-specific data are not available, age-stratified mean HSUVs from respondents who report they have none of the prevalent health conditions could be used.

Not surprisingly, the average decrement on HRQoL compared to the condition-specific baseline was generally smaller for respondents with a single health condition compared to respondents with the same health condition plus any comorbidities. For several conditions the decrement was more than halved. A majority of analytic models use cohorts defined to match those in the clinical studies used to represent the effectiveness of treatment. Therefore the data from cohorts with comorbidities are potentially more relevant as few clinical data are derived from patients who do not have any of the prevalent conditions, particularly in older age cohorts. However, some clinical studies do impose strict exclusion criteria relating to comorbidities. Consequently the clinical and HRQoL evidence and the cohort definitions used in economic models should be considered carefully when selecting the baseline HSUV used to estimate the benefits of treatments.

Our exploratory analyses suggest the decrements on HRQoL associated with health conditions are not constant across age. Some conditions showed an increasing trend and others showed a decreasing trend. This may be due to the prevalence of comorbidities and additional research in this area would be beneficial. In particular research in health conditions that have a substantial effect on HRQoL and cohorts subgrouped by severity of condition would be interesting.

Although we found a strong trend for HSUVs to decrease by age irrespective of health status, we observed a levelling or increase in mean HRQoL in the age groups 65 to 70 years. This has also been reported in data collected using several different preference-based measures in the United States [10]. This could be caused by a relationship between HRQoL and all-cause mortality rates (people with severe health conditions that have a large effect on HRQoL may be more likely to die at a younger age than those with less severe health conditions) followed by an increasing prevalence of comorbidities. Additional research is required to support this hypothesis.

There are limitations with the data used in this study. In particular the health conditions are self-reported, and no information was collected that could be used to determine either the duration of the health condition or the severity of the condition. There was a great deal of individual variation for respondents reporting the same health condition and this could be partly attributable to the wide range in severity of and duration of condition included within a single subgroup. The coded conditions are not exhaustive, and it is probable that some respondents had health conditions that are not included in the analyses. As the conditions that are not identified are not prevalent, this is unlikely to affect our main findings. The surveys did not sample people in nursing homes or other institutions who are likely to have lower HRQoL on average than those residing in their own homes. This is more likely to have an effect on the HSUVs for the older-aged cohorts, and it could be that the actual average EQ-5D scores for these subgroups are lower than we report. This may have an influence on the age-related trends in the decrements for the different health conditions, and additional research in this area would be interesting.

Some of the mean HSUVs for subgroups with a particular condition are lower than the corresponding values for subgroups without the condition or those from respondents irrespective of

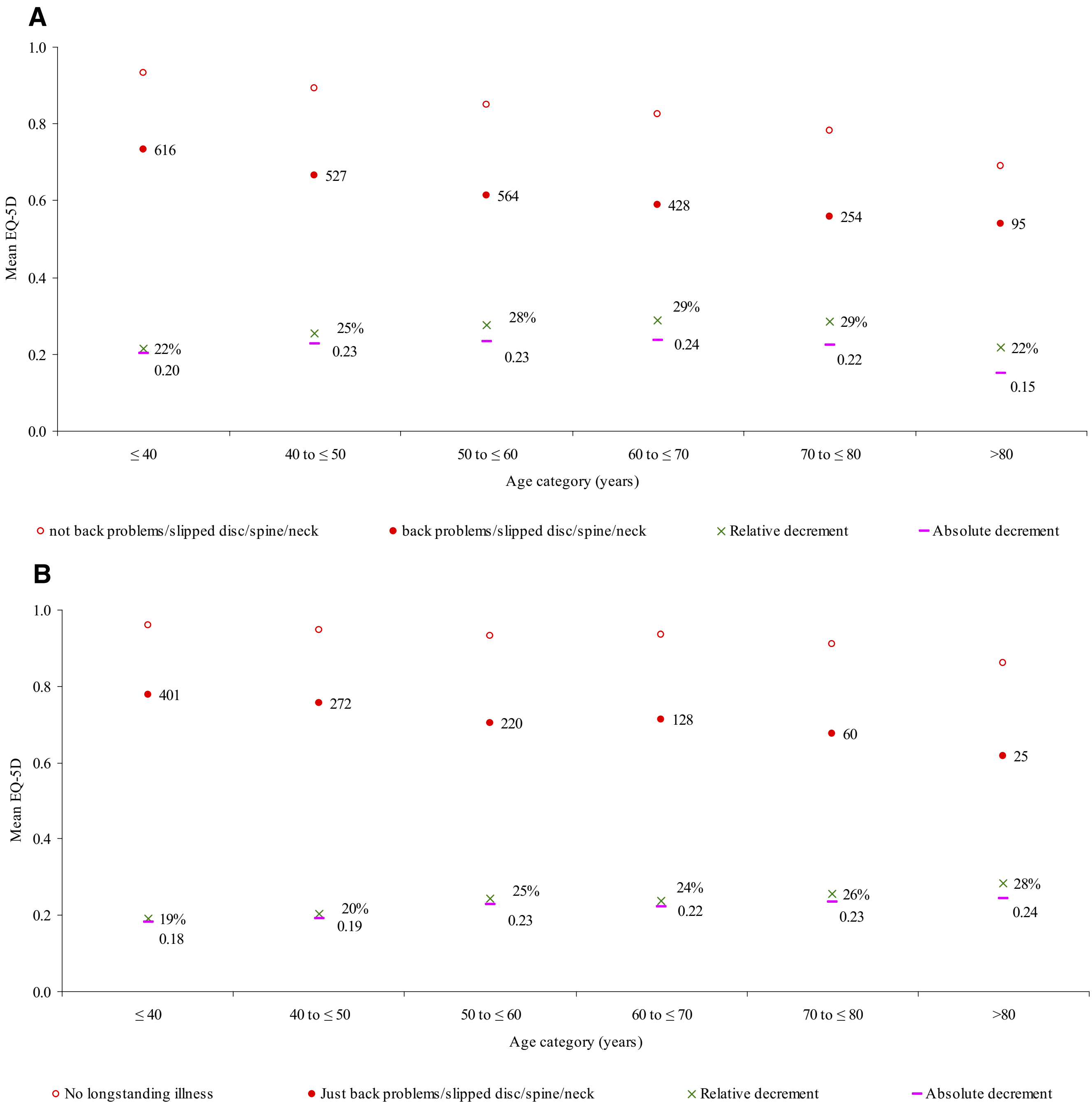

Fig. 2 – Mean EQ-5D scores and average decrements on health-related quality of life for respondents with back problems/slipped disc/spine/neck. (A) Respondents with back problems/slipped disc/spine/neck and any other health condition compared to respondents without back problems/slipped disc/spine/neck. (B) Respondents with just back problems/slipped disc/spine/neck and no other health condition compared to respondents with no condition. (The number of cases is shown next to data points for respondents who have the condition.)

health status, which initially appears counterintuitive. For the analyses conducted on subgroups with just one health condition, one possible explanation for higher HSUVs for the respondents with a condition is that the average person in the general population will in fact have a lower HSUV as the combined decrements on HRQoL for the prevalent conditions could be larger than the decrement for the single condition.

Decision analytic models of health care interventions require a baseline HRQoL profile to accurately calculate the benefits of treatment. These data would ideally be derived from respondents who do not have the exact definition of the health condition(s) being modelled. When these data are not available, this study provides a number of age and health condition stratified HSUVs that can be used to assess the benefits of treatment compared to an average person who does not have the condition. Our results suggest age-adjusted HSUVs from the general population could be used as the baseline when modelling the benefits of treatment for individuals with comorbidities. However, these data are not appropriate when modelling interventions in patients with a single health condition. Our findings require validation in additional data sets, and additional research examining subgroups of patients with precisely defined health conditions would be beneficial.

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Supplemental Materials

Supplemental material accompanying this article can be found in the online version as a hyperlink at doi:10.1016/j.jval.2010.10.029, or if hard copy of article, at www.valueinhealthjournal.com/issues (select volume, issue, and article).

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